



IN THE UNITED STATES PATENT AND TRADEMARK OFFICE

in re Application of:

Lawrence C. Lei

§

§ Group Art Unit: Unknown

Serial No.: 10/792,323

§

Confirmation No.: Unknown

§

Examiner: Unknown

Filed: March 3, 2004

§

For: Apparatus and Method for
Vaporizing Solid
Precursors for CVD or
Atomic Layer

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§

§

MAIL STOP AMENDMENT
Commissioner for Patents
P.O. Box 1450
Alexandria, VA 22313-1450

CERTIFICATE OF MAILING

37 CFR 1.8

I hereby certify that this correspondence is being deposited on
June 8, 2004 with the United States Postal Service as First
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6/8/04
Date

Keirn 2nd
Signature

Dear Sir:

SUPPLEMENTAL INFORMATION DISCLOSURE STATEMENT

The Applicants, and the Attorney who signs below on the basis of the information supplied by the inventor and the information in his file, submit herewith patents, publications, or other information of which they are aware, which may be material to the examination of this application and in respect of which there may be a duty to disclose in accordance with 37 CFR § 1.56.

While the information submitted in this Supplemental Information Disclosure Statement may be material pursuant to 37 CFR § 1.56, it is not intended to constitute an admission that any patent, publication, or other information referred to therein is prior art for this invention unless specifically designated as such.

In accordance with 37 CFR § 1.97, this Supplemental Information Disclosure Statement is not to be construed as a representation that a search has been made or that no other possibly material information as defined under 37 CFR § 1.56(a) exists.

The patents and/or publications submitted herewith are set forth on the attached Form PTO-1449.

If the sum of \$180.00 is due under 37 CFR § 1.17(p) pursuant to § 1.97, the Commissioner is hereby authorized to charge this fee, and any other fee necessary to make this submission timely, to the Deposit Account No. 20-0782/AMAT/5191.C1/KMT.

Respectfully submitted,



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Attorney for Applicant(s)

Substitute for Form 1449A/PTO JUN 14 2004 CS SUPPLEMENTAL INFORMATION DISCLOSURE STATEMENT BY APPLICANT <i>(Use as many sheets as necessary)</i>		Application Number	10/792,323		
		Filing Date	March 3, 2004		
		First Named Inventor	Lawrence C. Lei		
		Group Art Unit	Unknown		
		Examiner Name	Unknown		
		Attorney Docket Number	AMAT/5191.C1/ISM/CORE/MCVD/PJS		
Sheet	1	of	11	Submission Date	June 8, 2004

U.S. PATENT DOCUMENTS

Examiner Initials*	Cite No. ¹	Document Number	Publication Date MM-DD-YYYY	Name of Patentee or Applicant of Cited Document	Pages, Columns, Lines, Where Relevant Passages or Relevant Figures Appear
		Number-Kind Code ² (if known)			
A1		US-20040015300 A1	01/22/2004	GANGULI, ET AL.	
A2		US-20040014320 A1	01/22/2004	CHEN, ET AL.	
A3		US-20040013577 A1	01/22/2004	GANGULI, ET AL.	
A4		US-20040011504 A1	01/22/2004	KU, ET AL.	
A5		US-20040011404 A1	01/22/2004	KU, ET AL.	
A6		US-20030224107 A1	12/04/2003	LINDFORS, ET AL.	
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		Country Code ³ -Number ⁴ -Kind Code ⁵ (if known)				
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B2		GB 2 355 727 A	05/02/2001	SAMSUNG ELECTRONICS CO. LTD.		
B3		JP 01-175225	07/11/1989	FUJITSU LTD		
B4		JP 04-291916	09/23/1992	KOKUSAI ELECTRIC CO LTD		
B5		JP 05-047666	02/26/1993	FUJITSU LTD		

Examiner**Date Considered**

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		Group Art Unit	Unknown	
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A20		US-20030121241 A1	07/03/2003	BELKE	
A21		US-20030116087 A1	06/26/2003	NGUYEN, ET AL.	
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		Country Code ³ -Number ⁴ -Kind Code ⁵ (if known)				
B6		JP 05-206036	08/13/1993	RIKAGAKU KENKYUSHO		
B7		JP 05-234899	09/10/1993	HITACHI LTD		
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Date Considered

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				Group Art Unit	Unknown
				Examiner Name	Unknown
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				Sheet	3

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		Number-Kind Code ² (if known)			
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		Country Code ³ -Number ⁴ -Kind Code ⁵ (if known)				
B11		JP 2000122725	04/28/2000	CKD CORP; TOSHIBA CORP		
B12		JP 2000212752	11/12/2002	SAMSUNG ELECTRONICS CO LTD		
B13		JP 2000319772 (Abstract Only)	03/28/2000	P K LTD		
B14		JP 2001020075 (Abstract Only)	11/15/2000	ASM MICROCHMISTRY OY		
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		Filing Date	March 3, 2004		
		First Named Inventor	Lawrence C. Lei		
		Group Art Unit	Unknown		
		Examiner Name	Unknown		
		Attorney Docket Number	AMAT/5191.C1/ISM/CORE/MCVD/PJS		
Sheet	4	of	11	Submission Date	June 8, 2004

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		Number-Kind Code ² (if known)			
A55		US-20020092471 A1	07/18/2002	KANG, ET AL.	
A56		US-20020086106 A1	07/04/2002	PARK, ET AL.	
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A73

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		Country Code ³ -Number ⁴ -Kind Code ⁵ (if known)				
B16		JP 2001172767 A	06/26/2001	ASM MICROCHEMISTRY OY (US)		
B17		JP 58-097917 (Abstract Only)	06/10/1983	MATSUSHITA DENKI SANGYO KK		
B18		WO 00/16377	03/23/2000	GENITECH CO., LTD.		
B19		WO 00/54320	09/14/2000	GENUS, INC.		
B20		WO 00/79575 A1	12/28/2000	GENITECH, INC.		

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	A73	US-20010054769	12/27/2001	RAAIJMAKERS, ET AL.	
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	A90	US-6579372 B2	06/17/2003	PARK	

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	B21	WO 0079576 A1	12/28/2000	GENITECH, INC.		
	B22	WO 01/15220 A1	03/01/2001	ASM AMERICA, INC.		
	B23	WO 01/17692 A1	03/15/2001	ASM AMERICA, INC.		
	B24	WO 01/27346 A1	04/19/2001	ASM MICROCHEMISTRY OY		
	B25	WO 01/27347 A1	04/19/2001	ASM MICROCHEMISTRY OY		

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A91		US-6578287 B2	06/17/2003	ASWAD	
A92		US-6572705 B1	06/03/2003	SUNTOLA, ET AL.	
A93		US-6551406 B1	04/22/2003	KILPI	
A94		US-6511539 B1	01/28/2003	RAAIJMAKERS	
A95		US-6482733	11/19/2002	RAAIJMAKERS, ET AL.	
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Examiner Initials*	Cite No. ¹	Foreign Patent Document	Publication Date MM-DD-YYYY	Name of Patentee or Applicant of Cited Document	Pages, Columns, Lines, Where Relevant Passages or Relevant Figures Appear	T ⁶
		Country Code ³ -Number ⁴ -Kind Code ⁵ (if known)				
B26		WO 01/29280 A1	04/26/2001	ASM AMERICA, INC.		
B27		WO 01/29891 A1	04/26/2001	ASM AMERICA, INC.		
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B29		WO 01/36702 A1	05/25/2001	GENITECH CO., LTD.		
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Date Considered

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Substitute for form 1449A/PTO		Application Number	10/792,323	
SUPPLEMENTAL INFORMATION DISCLOSURE STATEMENT BY APPLICANT <i>(Use as many sheets as necessary)</i>		Filing Date	March 3, 2004	
		First Named Inventor	Lawrence C. Lei	
		Group Art Unit	Unknown	
		Examiner Name	Unknown	
		Attorney Docket Number	AMAT/5191.C1/ISM/CORE/MCVD/PJS	
		Sheet	7	of

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Examiner Initials*	Cite No. ¹	Document Number	Publication Date MM-DD-YYYY	Name of Patentee or Applicant of Cited Document	Pages, Columns, Lines, Where Relevant Passages or Relevant Figures Appear
		Number-Kind Code ² (if known)			
A109		US-6372598	04/16/2002	KANG, ET AL.	
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A111		US-6348376	02/19/2002	LIM, ET AL.	
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		Country Code ³ -Number ⁴ -Kind Code ⁵ (if known)				
B31		WO 02/08485 A2	01/31/2002	ASM INTERNATIONAL N.V.		
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Date Considered

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<p>Substitute for form 1449A/PTO</p> <p>SUPPLEMENTAL INFORMATION DISCLOSURE STATEMENT BY APPLICANT</p> <p><i>(Use as many sheets as necessary)</i></p>		Application Number	10/792,323		
		Filing Date	March 3, 2004		
		First Named Inventor	Lawrence C. Lei		
		Group Art Unit	Unknown		
		Examiner Name	Unknown		
		Attorney Docket Number	AMAT/5191.C1/ISM/CORE/MCVD/PJS		
Sheet	8	of	11	Submission Date	June 8, 2004

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Examiner Initials*	Cite No. ¹	Document Number	Publication Date MM-DD-YYYY	Name of Patentee or Applicant of Cited Document	Pages, Columns, Lines, Where Relevant Passages or Relevant Figures Appear
		Number-Kind Code ² (if known)			
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		Country Code ³ -Number ⁴ -Kind Code ⁵ (if known)				
B36	WO 96/17107		06/06/1996	MIKROKEMIA OY		
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		Filing Date	March 3, 2004		
		First Named Inventor	Lawrence C. Lei		
		Group Art Unit	Unknown		
		Examiner Name	Unknown		
		Attorney Docket Number	AMAT/5191.C1/ISM/CORE/MCVD/PJS		
Sheet	9	of	11	Submission Date	June 8, 2004

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<p>SUPPLEMENTAL INFORMATION DISCLOSURE STATEMENT BY APPLICANT</p> <p><i>(Use as many sheets as necessary)</i></p>			Application Number	10/792,323	
			Filing Date	March 3, 2004	
			First Named Inventor	Lawrence C. Lei	
			Group Art Unit	Unknown	
			Examiner Name	Unknown	
			Attorney Docket Number	AMAT/5191.C1/ISM/CORE/MCVD/PJS	
Sheet	10	of	11	Submission Date	June 8, 2004

U.S. PATENT DOCUMENTS

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		Country Code ³ -Number ⁴ -Kind Code ⁵ (if known)				
	B46					
	B47					
	B48					
	B49					
	B50					

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Substitute for form 1449B/PTO		Application Number	10/792,323	
SUPPLEMENTAL INFORMATION DISCLOSURE STATEMENT BY APPLICANT <i>(Use as many sheets as necessary)</i>		Filing Date	March 3, 2004	
		First Named Inventor	Lawrence C. Lei	
		Group Art Unit	Unknown	
		Examiner Name	Unknown	
		Attorney Docket Number	AMAT/5191.C1/ISM/CORE/MCVD/PJS	
		Sheet	11	of

Sheet

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of

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Submission Date

June 8, 2004

NON PATENT LITERATURE DOCUMENTS

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	C1	Kukli, <i>et al.</i> , "Tailoring the Dielectric Properties of HfO ₂ -Ta ₂ -O ₅ Nanolaminates," Applied Physics Letters, Vol. 68, No. 26, June 24, 1996; p. 3737-9	
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	C3	Kukli, <i>et al.</i> , " <i>In situ</i> Study of Atomic Layer Epitaxy Growth of Tantalum Oxide Thin Films From Ta(OC ₂ H ₅) ₅ and H ₂ O," Applied Surface Science, Vol. 112, March 1997, p. 236-42	
	C4	Kukli, <i>et al.</i> , "Properties of Ta ₂ O ₅ -Based Dielectric Nanolaminates Deposited by Atomic Layer Epitaxy," Journal of the Electrochemical Society, Vol. 144, No. 1, Jan. 1997; p. 300-6	
	C5	Kukli, <i>et al.</i> , "Properties of {Nb _{1-x} Ta _x } ₂ O ₅ Solid Solutions and {Nb _{1-x} Ta _x } ₂ O ₅ -ZrO ₂ Nanolaminates Grown by Atomic Layer Epitaxy," 1997; p. 785-93.	
	C6	Ritala, M., <i>et al.</i> , "Chemical Vapor Deposition," January 1999, p. 6-9	
	C7	Rossnagel, <i>et al.</i> , "Plasma-enhanced Atomic Layer Deposition of Ta and Ti for Interconnect Diffusion Barriers," J. Vac. Sci. Technol. B., Vol. 18, No. 4 (July 2000); p2016-20	
	C8	Niinisto, <i>et al.</i> , "Synthesis of Oxide Thin Films and Overlays by Atomic Layer Epitaxy for Advanced Applications," Materials Science and Engineering B41 (1996) 23-29	
	C9	Eisenbraum, <i>et al.</i> , "Atomic Layer Deposition (ALD) of Tantalum-based materials for zero thickness copper barrier applications," Proceedings of the IEEE 2001 International Interconnect Technology Conference (Cat. No. 01EX461) 2001	

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Date Considered

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